



# EFFECT OF MULTIMEDIA METHOD OF INSTRUCTION ON READING COMPREHENSION OF STUDENTS WITH DYSLEXIA

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## ABSTRACT

There is ample research conducted on comparison of electronic method of instruction versus printed text or traditional method of instruction. The conclusion, however, are not very satisfactory or consistent. Some studies support multimedia method of instruction, whereas, some research studies bring to the conclusion that there is no difference between the multimedia method of instruction and print method. It is argued that electronic storybooks include multimedia features that may support story understanding, but when compared with printed text, it was seen that multimedia method of instruction/multimedia story books lack that tangible feeling that children like the most and keep them with books. This study analysis the effect of multimedia method of instruction (Experimental Group) over traditional print method (Control Group) of instruction on reading comprehension of students with dyslexia. Thirty 5th grade students with dyslexia studying in Government Schools of Chandigarh constitute the sample of the study. Fifteen students were taught through Multimedia method of Instruction and acted as Experimental Group and the remaining fifteen students with dyslexia were taught through traditional method (print text) of instruction and acted as Control Group. Design of the study was pretest posttest experimental in nature.

**KEYWORDS:** Multimedia Method of Instruction, Traditional Method of Instruction, Dyslexia, Reading Comprehension.

## INTRODUCTION:

Reading comprehension is often very difficult task for students with dyslexia. They are challenged by word recognition; they may forget a word even though they have seen it several times. They often spend too much time and power in reading and understanding some words, due to which they often do not understand the meaning of that passage or they have to read that passage again and again to understand it. An in-depth report, completed by the National Reading Panel in 2000, provides a look at how teachers can best teach students reading comprehension. Reading Comprehension skill is considered to be essential, not only in learning to read but also in lifelong learning. Reading comprehension was considered as one of the five most important skills in developing reading.

Students with dyslexia often focus so much on sounding out each word they miss the meaning of what they are reading. This deficiency in reading comprehension skills can cause problems not only in school but throughout a person's life. Some of the problems that occur are a lack of interest in reading for pleasure, poor vocabulary development and difficulties in employment, especially in job positions where reading would be required. Teachers often spend a great deal of time helping children with dyslexia learn to decode new words, decoding skills and improving reading fluency. Sometimes reading comprehension is overlooked. But there are many ways teachers can help students with dyslexia improve their reading comprehension skills.

Computer software has the extraordinary ability to bring individualized learning to learners who need to improve their fluency in reading. CD-ROM storybooks can help poor readers improve vocabulary in addition to offering practice in the development of reading fluency (Pearman and Lefever-Davis, 2006). The ability to identify sound symbol connection is necessary, but it is not enough for comprehension. Students also need to trigger their previous knowledge and use context clues to comprehend what they read. There is growing evidence that computer-supported effects such as animation and sound allow students to make these connections (Matthew, 1997).

CD-ROM storybooks can support the development of the five key features of reading instruction recognized by The National Reading Panel: phonics, phonemic awareness, fluency, vocabulary, and comprehension. Particular features inherent in these texts, audio pronunciation of text, embedded vocabulary definitions and animated graphics can be used to support readers' development of different reading skills (Pearman, and Lefever-Davis, 2006).

The use of interactive CD-ROM storybooks can help to improve reading comprehension of elementary students. Furthermore, CD-ROM storybooks establish the story setting by means of animated graphics and sound effects that indicate story mood and events and thus supporting comprehension (Lefever-Davis, and Pearman, 2005). Visual aids in electronic CD-ROM storybooks are helpful for understanding text and building coherent mental representation. Multimedia presentation, which includes text, graphics, sound, and animated images, is also helpful motivation for a struggling reader who is particularly uninterested (Greenlee-Moore and Smith, 1996).

Paradoxically, the ability to provide sound, animations and video clips can also

be distracting for learners. What is an advantage to some may be a limitation to others; inexperienced computer users have little or no previous knowledge of the software and/or technology that can be used to help them maintain track of learning. Additionally, many learners may have a poor self-efficacy in regard to computer skills.

## OBJECTIVES:

1. To study the effect of multimedia method of instruction on reading comprehension of students with dyslexia.
2. To compare the effect of multimedia and conventional methods on reading comprehension of students with dyslexia.

## HYPOTHESIS:

1. There will be no significant effect of multimedia method of instruction on reading Comprehension of students with dyslexia.
2. There will be no significant difference in reading Comprehension of students with dyslexia taught by multimedia and conventional methods.

## MATERIALS AND METHODS:

### DESIGN:

The study was experimental in nature and involved pre-test and post-test design. It involved one experimental groups and one control group wherein students of experimental group were taught using Multimedia Method of Instruction and students of the control group were taught using conventional method (printed text). Teaching methods/strategies (Multimedia and conventional methods) were independent variables. Reading Comprehension was dependent variables.

### SAMPLE:

The investigator took list of schools under the administration of Union Territory Chandigarh available on the website of Education Department Chandigarh. Investigator purposively selected those government model high schools of Chandigarh where facility of teaching through computer was available. Researcher took permission of data collection from the District Education Officer (DEO) who shortlisted 10 schools out of 15 schools mentioned in the permission letter submitted by researcher. Out of these 10 schools researcher purposively selected two schools on the basis of number of students, facility of working computer lab (with internet facility) and school timings (evening shift). Students were initially identified with dyslexia by using teacher's referral form and then IQ testing was done with the help of Ravens Standard Progressive Matrices. The students who possessed average or above average intelligence were then administered DTRD (Diagnostic Test of Reading Disorder). Matching of sample unit was done on the basis of Intelligence age and class wise. Finally identified students were randomly assigned to the experimental and control group. The final sample of the study constituted 5th grade 15 students with dyslexia assigned as experimental group and other 15 students with dyslexia assigned as control group.

### PROCEDURE:

**Phase I:** Process of identification and formation of Experiment and Control

groups.

**Phase II: Pre Testing:** Second phase involved administration of researcher made questionnaire of reading comprehension to the students of experimental and control groups.

**Phase III: Instructional Treatment:** In this phase Multimedia method of Instruction as intervention was provided to sample units of experimental group, whereas control group was subjected to the conventional/traditional method of teaching. Pre testing was followed by intervention for 30 working days (40min. / day / group).

**Phase IV: Post-testing:** This last phase consisted of re-administration of researcher made reading comprehension questionnaire to experimental and control groups in order to assess and compare effectiveness of different instructional strategies on reading comprehension of students with dyslexia.

#### TOOLS FOR DATA COLLECTION:

1. Identification tools used:
  - a. Teacher's Referral Form to identify the students with dyslexia (Researcher made)
  - b. Diagnostic Test of Reading Disorder (DTRD) by Swarup and Mehta (2003) to identify students with dyslexia.
  - c. Standard Progressive Matrices (SPM) by Raven, Raven & Court (2000) to identify the intelligence level of the students.

2. Assessment tool used:
  - a. Reading Comprehension Questionnaire (Researcher made)

#### STATISTICAL ANALYSIS:

Paired sample t-test was used to study the effect of Multimedia method of Instruction on Reading comprehension of students with dyslexia.

Independent sample t-test was used to study the significant differences between the Multimedia method of Instruction and Conventional Method on reading comprehension of students with dyslexia.

#### RESULTS AND DISCUSSION:

##### A. Descriptive Statistics:

**Table 1: Mean, Median, Mode, Standard Deviation, Skewness, and Kurtosis Values for Reading Comprehension of students with dyslexia in Experimental Group (Multimedia Method) and Control Group (Traditional Method) at the pre-test stage.**

Variable	Group	Mean	Median	Mode	SD	Ku	Sk
Reading Comprehension	Multimedia method Group	12.80	12.750	12.75	.912	-.897	-.134
	Control Group	12.883	13.00	11.50	1.179	.136	.559

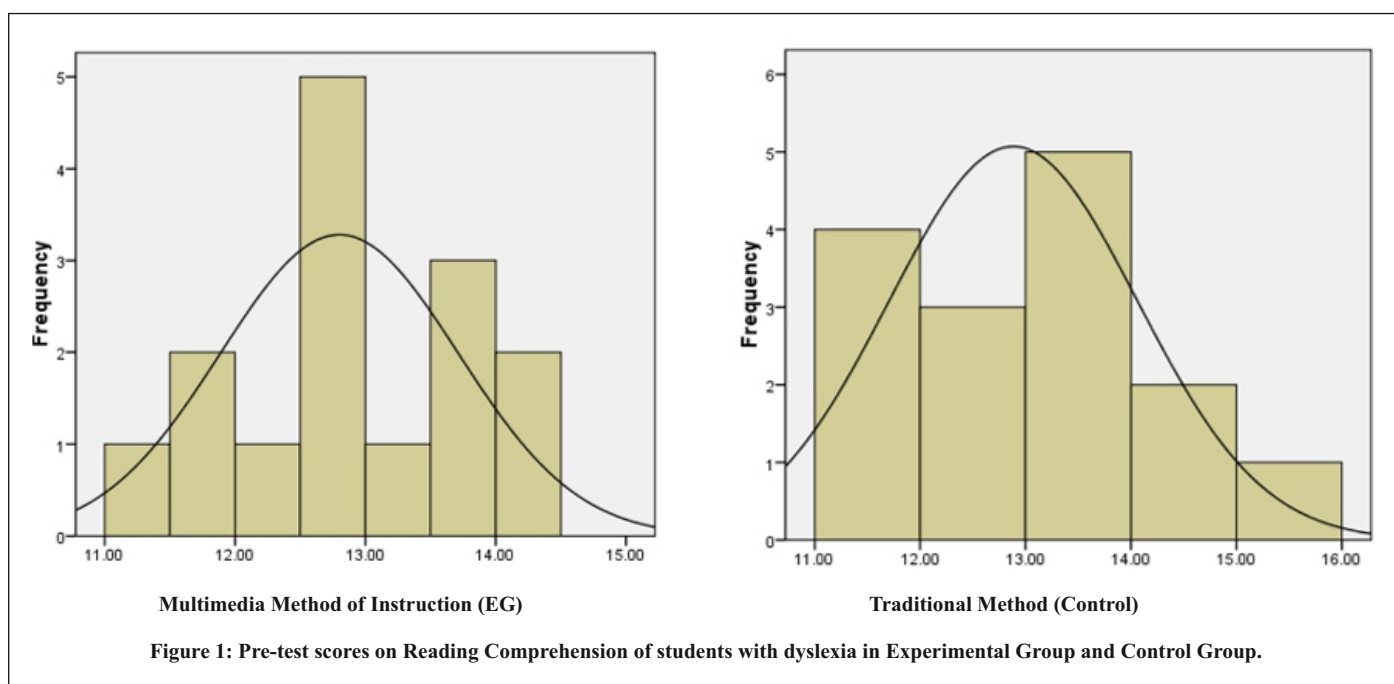


Table 1. Shows that the mean scores on Reading Comprehension at the pre-test stage for students with dyslexia in Experimental Group and Control Group are 12.80 and 12.883 respectively. The value of kurtosis was found to be -.897 for EG and .136 for CG. The value of skewness for EG was found to be -.134 and .559 for CG. The value of skewness lies within the acceptable limits of normality of distribution. Also, mean, median and mode are approximately equal. Thus, the distributions of measure Reading Comprehension (pre-test measure) for EG and CG can be considered as normal.

#### Levene's Test of Homogeneity of Variance:

**Table 2: Homogeneity of variance for the assessment towards Reading Comprehension of students with dyslexia in Experimental (N=15) and Control Group (N=15)**

	Levene's Statistic	df <sub>1</sub>	df <sub>2</sub>	p-value
Pre-test	.790	1	28	.382

Table 2. Shows the values of Levene's test of homogeneity of variance for pre-test scores on Reading Comprehension of students with dyslexia. The Levene's statistic on Reading Comprehension of students with dyslexia is .790, with degrees of freedom (df<sub>1</sub>) for between the group as 1, degrees of freedom (df<sub>2</sub>) for within group as 28. The p-value came out to be .382, which is greater than .05 and is insignificant. This implies that Experimental and Control Group are homogeneous at the pre-test stage of evaluation w.r.t to Reading Comprehension.

#### B. Inferential Statistics:

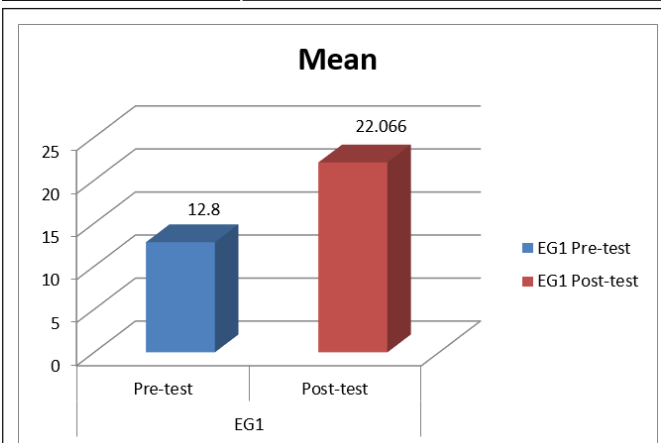
After completion of the testing, the scores students gained on the pretest and posttest measures were tabulated. Results and interpretations of main objectives are presented in this section.

**Objective 1:** To study the effect of Multimedia Method of Instruction on reading comprehension of students with dyslexia.

**Hypothesis 1:** There will be no significant effect of Multimedia Method of Instruction on reading comprehension of students with dyslexia.

**Table 3: Paired sample t-test for pre-test and post-test scores of Multimedia Method of Instruction (EG) on Reading Comprehension of students with Dyslexia.**

Group	Stage	Mean	SD	SE <sub>M</sub>	df	Difference in means (post-pre)	t-value	Sig.
EG	Pre-test	12.800	.912	.235	14	9.266	22.52	.000
	Post-test	22.066	1.615	.417				



**Figure 2: Pre-test and post-test scores on Reading Comprehension in Multimedia Method of Instruction (EG1) of students with dyslexia.**

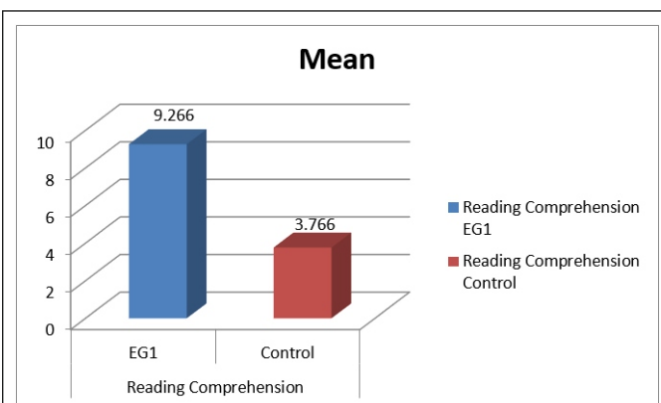
The mean gain score on Reading Comprehension of students with dyslexia (Table 3 and Fig. 2) in the Experimental Group (Multimedia Method of Instruction) was 9.266 and mean gain difference was found to be significant ( $p < .01$ ). Hence, the null hypothesis stating, "There will be no significant effect of Multimedia Method of Instruction on reading comprehension of students with dyslexia" is rejected. It can, therefore, be inferred that the Multimedia Method of Instruction had significant effect on Reading Comprehension of the students with dyslexia.

**Objective 2:** To compare the effect of Multimedia Method of Instruction and Conventional Method on reading Comprehension of students with dyslexia.

**Hypothesis 2:** There will be no significant difference in reading comprehension of students with dyslexia taught by Multimedia Method of Instruction and Conventional Methods.

**Table 4: Independent sample t-test between for pre-test and post-test gain scores on Reading Comprehension of students with Dyslexia between Multimedia Method of Instruction (EG) and Traditional Method (CG).**

Variable	Group	Mean	SD	SE <sub>M</sub>	df	t-value	P value
Reading Comprehension	EG1	9.266	1.593	.411	28	10.936	.000
	Control	3.766	1.119	.283			



**Figure 3: Mean scores on Reading Comprehension of students with dyslexia of Experimental Group (N=15) and Control Group (N=15)**

The mean gain scores on Reading Comprehension of students with dyslexia (Table 4 and Fig. 3) in Experimental Group and Control Group were found to be 9.266 and 3.766 respectively and the mean gain difference was found to be significant ( $p < 0.01$ ). Hence, the null hypothesis stating, "There will be no significant difference in reading comprehension of students with dyslexia taught by Multimedia Method of Instruction and conventional methods" is rejected. It can, therefore, be inferred that the Multimedia Method of Instruction as intervention is significantly effective intervention than the Traditional Method on Reading Comprehension of the students with dyslexia.

#### CONCLUSION:

The findings of the present study indicated that multimedia method of intervention of stories motivated the dyslexic students to read, thus, positively affecting the reading comprehension of such students. Multimedia method of instruction has features like video in the form of animation, audio facility with subtitles

which fascinated and engage the students with dyslexia in reading and help them to make connection between visuals and text formats. It helps them to recall previous knowledge and use it to read and comprehend in the future. Thus the present study showed the positive effect of multimedia method of instruction on reading comprehension of students with dyslexia over conventional method of instruction.

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